



NEWSLETTER #10

HYBRID MANUFACTURING

Multi-material | *Lightweight* | Complex Geometry

[PROJECT WEBSITE](#)

PROJECT UPDATES

Welcome to the **latest edition of the DISCO2030 newsletter**. This quarter, the project continues to translate its core concept - hybrid additive manufacturing of dissimilar material systems - into demonstrator-ready process chains for demanding environments in **space, marine** and **cryogenic hydrogen applications**.



Across all three use cases, DISCO2030 is progressing two hybrid AM routes, metal-metal and metal-polymer, toward TRL 6 demonstrations.

Work is focused on **final design iterations**, **process-parameter recipe books**, and **test protocols** that scale from coupons to demonstrator components and support future standardisation activities.

[Project Website](#)

USE CASE	CURRENT FOCUS	WHY IT MATTERS
Rocket Engine	Bimetallic copper-alloy liner with nickel-alloy DED close-out/exoskeleton; injector-head & combustion chamber qualification planning.	Demonstrates multi-material AM for high heat-flux propulsion hardware and prepares hot-fire validation.
Marine Heat Exchanger	Hybrid metal-metal manufacturing route for copper/inconel demonstrator structures and inspection of joined regions.	Targets compact, high-performance heat management solutions for harsh industrial operation.
Cryogenic Hydrogen Tank	Metal-polymer process chain involving AM liner structures and carbon-fibre-reinforced thermoplastic overwrap concepts.	Supports lightweight, robust storage systems under cryogenic and cyclic load conditions.

USE CASE SPOTLIGHT

LOX/Methane Bimetallic Combustion Chamber

A key dissemination highlight is the presentation of DISCO2030 Use Case 1: a subscale LOX/CH4 thrust chamber assembly that combines Powder Bed Fusion and laser powder-based Directed Energy Deposition.

The concept uses a copper-alloy inner liner to support efficient heat extraction and a nickel-alloy close-out in the form of a topologically optimised exoskeleton to provide stiffness and structural integrity.

The demonstrator is designed to be representative of a scalable rocket-engine technology pathway. The planned validation sequence first de-risks the injector head with a robust water-cooled chamber and then installs the bimetallic DISCO2030 demonstrator with LNG regenerative cooling.

The main test objectives are to verify the regenerative cooling circuit and the thermomechanical integrity of the bimetallic components.



disco2030.eu/disco2030-background.html

PUBLICATION HIGHLIGHTS



The highlighted publications show how DISCO2030 combines process development, application-led demonstrators and enabling sensor/material knowledge. Together, they strengthen the scientific basis for hybrid AM of dissimilar materials and for validation of components operating in harsh environments.

<p>Review on recycling of carbon fibre reinforced thermoplastics with a focus on polyetheretherketone</p> <p>CF-PEEK RECYCLING REVIEW</p> <p>An open-access review summarizes key recycling routes for CF-PEEK, highlighting mechanical recycling while noting challenges such as fibre shortening and matrix degradation.</p> <p>READ PUBLICATION</p>	<p>LOX METHANE BIMETALLIC COMBUSTION CHAMBER FOR FUTURE DEVELOPMENT OF EUROPEAN SPACE LAUNCHERS</p> <p>LOX-METHANE BIMETALLIC COMBUSTION CHAMBER</p> <p>A conference paper outlining the development of a bimetallic LOX-methane combustion chamber, combining an additively manufactured copper liner with a nickel exoskeleton.</p> <p>READ PUBLICATION</p>	<p>An Opto-Mechanical FEM Model in Polarization-Maintaining Optical Fibers With Photonic Bragg Gratings</p> <p>OPTO-MECHANICAL FEM MODEL IN PM FIBERS</p> <p>A journal paper presenting a 3D opto-mechanical model for fiber Bragg gratings in polarization-maintaining fibers, enabling more accurate multi-axial and embedded fiber-optic sensing.</p> <p>READ PUBLICATION</p>
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UPCOMING EVENTS

formnext

Formnext Frankfurt – join us for the AM industry highlight

EXPO & CONVENTION

FORMNEXT 2026

17.11 - 20.11.2026 at Frankfurt, Germany

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35XIVY

JUNE 2026

NEC, Birmingham, UK

Welcome to **TCT3Sixty**

TCT 3Sixty 2026

2.06 - 4.06.2026 at NEC Birmingham, UK



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